

5E Lesson Plan

Topic: Population Biology

Grade Level: 11-12th

Logistics Information:

- a. Iowa Core Essential Concepts: **Science as Inquiry and Life Science.**
 - Identify questions and concepts that guide scientific investigations.
 - Design and conduct scientific investigations.
 - Understand and Apply Knowledge of the interdependence of organisms.
- b. Skills:
 - Use the scientific method.
 - Develop and test a hypothesis.
 - Develop research strategies.

Characteristics of Effective Instruction are embedded in the learning cycle. (Student-centered Classroom; Teaching for Understanding; Assessment for Learning; Rigor and Relevance; Teaching for Learning Differences)

Background Information (What do observers need to know about our learners, classroom and school?): This is a lesson for upper level Environmental Science students who are hands on learners.

Materials Required: Small mammal live traps, cotton, bait(peanut butter/cracker corn, etc), gloves, net, permanent markers(different colors), tablet(to record data)

Time Period: Total time for lesson will be four to five days spread out over a two – three week time period.

Name of the Unit: Deer Mouse Population Study

Plan of the Unit

- a. Goals of the unit:
 - 1. To have students understand how populations can be estimated by using scientific research and math formulas.
 - 2. Learn how many environmental factors can influence the well being of a species in a region
- b. How this unit related to the curriculum: Animal Populations are indicators of the health of the environment

Previous Grade/Course	Current Grade/Course	Next Grade/Course
10 th /Biology	11-12/ Environmental Science	12/Advanced Biology

Lesson Plan:

Phases of the lesson: learning activities and key questions (and time allocation)	Student activities/ anticipated student reactions or responses	Teacher’s response to student reactions/ Things to remember	Evidence of Student Understanding
ENGAGE: Use Oh! Deer – Project WILD P. 36. As intro to unit to help explain the purpose of the unit.	Anticipate enthusiasm to be generated for the topic. Connections with Population and main components in a habitat.	Need to concentrate on getting the students to understand the concepts and not get too carried away in the game.	When students demonstrate or explain how each habitat component can impact a given animal population.
EXPLORE: Students will set up a research project where deer mouse populations will be tracked.	Most students like to work with live animals. Students need to be taught proper care and handling of the specimens. Students will learn how to properly bait and mark captured mice.	Make sure students keep accurate data. Important to emphasize respect and care for the specimens and that they are returned to the wild safely.	When students successfully set and bait traps, catch and release mice, and record data for later use.
EXPLAIN: Teach the Peterson Formula for population estimates of a given animal population.	Some students may be reluctant to learn the math involved in using the formula to come up with a population estimate.	Important to explain the terminology of the unit. Explain the math formula and what captured, recaptured, marked etc. means	When students demonstrate how to estimate the deer mouse population by appropriately using the Peterson Formula with the collected data.
<p>ELABORATE: Use the snow goose as a discussion about habitat problems that can occur because out of control populations.</p> <p>EVALUATE: Students will work in teams and write and present an oral report about their experience and what they learned.</p>	<p>Students will make suggestion on how to control population and make inferences into the long term health of the population.</p> <p>Students will do quality work in their group project, because of the interest level and because the team will generate enthusiasm.</p>	<p>Teacher should encourage students to look at impact of snow goose population on other species.</p> <p>Teacher will provide a rubric of requirements necessary to get an acceptable grade.</p>	<p>Students will correlate similarities of snow geese to the mouse population studied.</p> <p>When students can explain the activity, results and what they learned to their peers.</p>

Briefly note how the characteristics of effective instruction are incorporated in the learning cycle.

Students will be able to use sound research and experiences to make explanations about factors that may affect animal populations. Student will work in cooperative units and learn to collect and record data. Use scientific process in making a hypothesis and looking at ways to test and support it.